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The JOURNAL of GEOGRAPHY

VOLUME XLVIII JANUARY, 1949 NUMBER 1

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The JOURNAL *of* GEOGRAPHY

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Dr. Durand is Professor of Geography at the University of Tennessee. His research work has made him an authority on the American Dairy Region concerning which he has published six articles in *Economic Geography*. The present article was prepared for the JOURNAL with the specific objective of providing an abundance of material for the use of teachers. Dr. Durand is joint author of the high school text "The Working World: an Economic Geography."

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Miss Hatcher is Professor of Geography at Murray State Teachers College, Murray, Kentucky. From January 1, 1948 to September 20, 1948 she served as Assistant Specialist for Geography and Conservation, Division of Secondary Education in the United States Office of Education. During the war she served as Cartographer in the Map Division of the Office of Strategic Services.

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Mr. Taylor is a member of the Geography Staff at Stanford University. He did his graduate work at Columbia and Clark universities. For several years he was Principal of the Anglo-Chinese School at Ipoh, Malaya. During the war he served as an officer in the United States Navy with special duties connected with Military Government and Naval Administration in the Trust Territory of the Pacific and at the School of Naval Administration at Stanford University.

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Mrs. Blouch is a teacher in the Hayes School, Lakewood, Ohio and a leader in geographic education. Other articles by Mrs. Blouch will be found in the JOURNAL for October and November, 1948.

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VOLUME XLVIII JANUARY, 1949 NUMBER 1

THE AMERICAN DAIRY REGION

LOYAL DURAND JR.
University of Tennessee

The American Dairy Region is one of the major subdivisions of the agricultural United States. It is recognized as a major unit, comparable to the Corn Belt or the Cotton Belt, and is indicated upon all continental maps, either as a Dairy Region *per se,* a Hay and Pasture Belt, or under a somewhat similar title. Specific boundaries delimiting the region differ slightly among authors, dependent in part upon the type of item that individuals have used along the transitional border zone between the dairylands and the adjacent land use areas.

GENERAL EXTENT

The American Dairy Region extends from the Atlantic Coast in New England to its dry-land western border in the Red River Valley of western Minnesota and eastern North Dakota, where it merges into the Spring Wheat Belt. The air-line east-west extent is some 1300 or more miles. If the continental, rather than merely the American, extent is included, the distance is greater, because the dairy areas of Maritime Canada, in southern New Brunswick, Nova Scotia, and Prince Edward Island, continue the agricultural region eastward from its general limit of southeastern Maine in the United States. From north to south the Dairy Region is 200 to 300 miles in width. It lies between the Northern Forest and Cut-over on the one hand and the Corn Belt (west of the Appalachians) and general farming area of the Pennsylvania-New Jersey country-side on the other. Both the northern and southern borders are transitional in many respects. There are isolated far northern dairy areas surrounded by forest lands, as in some of the northern clay belts of Ontario, and in certain parts of northern Minnesota,

northern Wisconsin, and the Upper Peninsula of Michigan. Also, immediately to the south of the Dairy Region there are important dairy districts in "Corn Belt latitudes," as in parts of southeastern Pennsylvania. In fact, some types-of-farming classifications, such as that made by the former National Resources Board, place this part of Pennsylvania in the Dairy Region.

The Dairy Region, so far as the United States portion is concerned, can be divided into an intensive eastern region and an intensive western region west of Lake Michigan, with a sag of moderate intensity between, in the Lower Peninsula of Michigan. The eastern region includes nearly all of upstate New York, northern Pennsylvania, northeastern Ohio, Vermont, the southern parts of New Hampshire and Maine, and the states of southern New England. The very intensive dairy region west of Lake Michigan

TABLE I

PRESENT RANKS OF STATES (NOT IN PROPORTION TO AREA)

Milk Cows	*Total Butter*	*Total Canned Milk*
1. Wisconsin	1. Iowa	1. Wisconsin
2. Minnesota	2. Minnesota	2. Ohio
3. Iowa	3. Wisconsin	3. California
4. New York	4. Nebraska	4. Michigan

Total Cheese	*Total American Cheese*	*Total Foreign Cheese*
1. Wisconsin	1. Wisconsin	1. Wisconsin
2. Illinois	2. Illinois	2. New York
3. New York	3. Missouri	3. Illinois

includes extreme northeastern and northwestern Illinois, nearly all of Wisconsin, northeastern Iowa, and southeastern and east-central Minnesota. Lower Michigan is transitional between the two portions.

The subdivision of the Dairy Region into an eastern and a western part is fundamental not only as to location, but also as to cropping systems and type of product. The eastern part of the Dairy Region, is, in general, a fluid market milk area. Milk is sent to the cities. The western part of the Dairy Region is an area of manufacture, and milk is the raw material used in the manufacture of dairy products. Lower Michigan, the "sag" between the two portions of the major region, exemplifies characteristics of each.

CLIMATIC RELATIONSHIPS

The general location of the American Dairy Region is essentially that of the Humid Continental Short Summer climate, or the

Dfb climate of the Köppen system. Summers within the region as a whole do not average as high as 70°, altho in the southern portion of the area one or two of the summer months commonly average just over this figure. Along parts of the southern zonal border the three summer months attain an average of about 70°; this is a critical summer isotherm for corn. The Dairy Region, consequently, lies to the north of the main corn-producing areas of the United States.

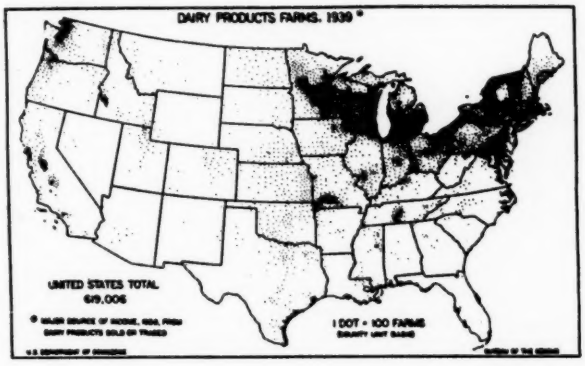

Fig. 1. The national distribution of farms classified by the Bureau of the Census as "Dairy Products Farms." The boundaries of the American Dairy Region are shown very well by this map except in northeastern Iowa, where many dairy farms produce enough corn and livestock to place them in a dairy-combination type of agriculture instead of dairying alone.

The eastern portion of the Dairy Region and the Great Lakes portion have a somewhat cooler summer, latitude for latitude, than the western portion, west of Lake Michigan. Corn is less important in these cooler areas, and is commonly raised only as silage corn. The percentage of cultivated land in a hay crop is high, up to 60 per cent in large areas, and permanent hay land is important. West of the Lake, in Wisconsin, northeastern Iowa, and southeastern Minnesota corn is relatively more important, more is raised, and some of the surplus not utilized for silage is harvested as grain, shocked for fodder, shredded for feed, or hogged down. Hay occupies a lower percentage of the cultivated land, commonly from 20 to 40 per cent, and rotation hay and rotation pasture is more important than in the East. These sub-regional cropping practices result in considerable difference in the feeding practices of the two ends of the Dairy Belt. New York and New England farms possess a large hay acreage per farm, western dairy farms a somewhat smaller hay acreage per farm, but larger corn and small grain acreage. Eastern dairymen, as a result, are large buyers of grains and concentrates, and a New York dairyman has a considerable feed bill for purchased feeds. The Wisconsin dairyman is able to

produce a larger proportion but not all, of his "variety" feeds from his own land. The percentage of farm land in a hay crop thus, in general, increases both eastward and northward in the Dairy Region. Even in Wisconsin the percentage of land in hay increases toward the cooler Lake Michigan shore, while the percentage of land in corn increases westward from the Lake.

The over-all climatic environment—the cool summers, the drizzly frontal rainfall of fairly long duration in hours, the cool and damp springs, and the low rate of evaporation—all combine to produce good pasture and hay land. Baker named the area the Hay and Dairying Region, and originally delimited it on the basis of proportion of land in a hay crop.[1] Grasslands, whether in hay or permanent pasture, are usually of good quality thruout the area, are able to maintain a high carrying capacity when grazed, and are dependable year after year.

The large and substantial basement barns of the American Dairy Region are a necessity, owing to the severe winters. Cattle must be housed during long periods of inclement weather, and great quantities of hay must be stored for the winter feeding season. Some more northern portions of the Dairy Region actually possess larger and more substantial barns than more southern portions, in part a relationship to more recent construction, and in part to the longer feeding season, and consequent greater need for haymow space.

Surface Configuration and Soils of the Dairy Region

A large proportion of the American Dairy Region is in the section of most recent, or Wisconsin, glaciation. The surface is undulating to rolling or rough where there are moranial or drumlin areas or where there are glacial hill lands. Numerous lakes, marshes, and swamps are the result of the disruption of drainage by the continental glacier. Large areas are too wet for tillage, but can be utilized for pasture or hay. Stoniness of many sections interferes with cultivation, but permits hay and pastures. Morainal areas furnish wooded pasture. Most farms contain combinations of glacial surfaces which permit a grassland on the more rolling surfaces and cropland on the flatter areas, such as the outwash plains and till plains. The detail of surface thruout the region is infinite, but the pattern is somewhat repetitive over large areas.

[1] O. E. Baker, Agricultural Regions of North America; Part V—The Hay and Dairying Belt, *Economic Geography*, Vol. 4, 1928, pp. 44-73.

The great variety of forms, and the irregularity of the drift sheet, provides for great local variation in soils as well as surface, but even these can nearly all be grouped into the grey-brown podzolic types, when viewed on a continental basis, thruout most of the Dairy Region. These grade northward into the podsols of the areas that were originally covered with coniferous forests.

The rolling surface configuration, combined with cool summers, tempts the farmer toward cattle rather than crop emphasis. Timothy and clover, and oats, are at their best in the climatic setting, being aided rather than handicapped by the cool springs. Moreover hay can be raised on slopes and in swales, either too steep and stony, or too wet for tillage. The lower lands support profuse, luscious, and nutritious grasses. These are verdant thruout the pasture season owing to a combination of high water table, heavy dews, and "low" temperatures. The temperatures, in conjunction with winds of only moderate velocity result in but little transpiration and evaporation when compared to the Corn or Wheat Belts; the Dairy Region, in other words, is "humid." Perennial streams and lakes supply water to many pastures, thus helping to keep the herds at a uniform milk flow.

The surface configuration of one portion of the Dairy Region departs from the average. The southwestern portion of Wisconsin is in the well-known Driftless Area. The surface is one of rough plain to low hill country, with undulating ridge tops, steep wooded hillsides, and flat-floored valleys. Dairying continues unabated across the Driftless Area, with its valley-flat pastures and wooded side hill pastures. Northeastern Iowa, likewise not mantled by drift

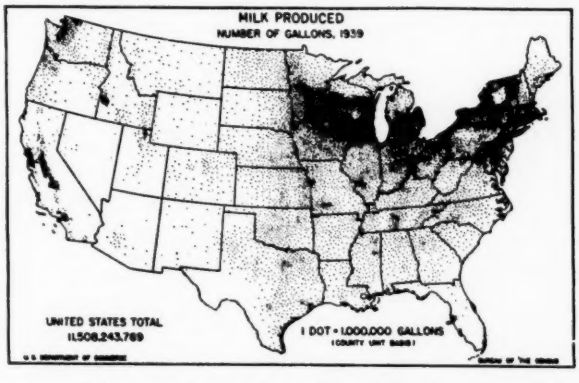

Fig. 2. The intensity of milk production in the American Dairy Region is apparent from this map. Notice the intensive eastern region of milk production, centering in upstate New York, and the region of intensive production west of Lake Michigan. Notice also the importance of northeastern Iowa, and the somewhat lessened production per unit of area in southern Michigan. The "hole" in the western dairy area is the Central Sand Plain of Wisconsin, and the "hole" in northern New York is the Adirondack Mountains.

of Wisconsin age, is an undulating, rolling to rough plain- low hill country dairy area, whether in the small Iowa portion of the Driftless Area or in the regions covered with glacial drift of Iowan (early Wisconsin) age.

The Human Element

Dairy farming is engaged in by American farmers of practically all ancestries. Probably, considering the region as a whole, farmers of early American ancestry are most numerous, and especially important in Vermont, New York, Pennsylvania, Ohio, Michigan, large areas of southeastern Wisconsin, and parts of northeastern Iowa and southeastern Minnesota. Persons of German ancestry are also numerous, particularly in Wisconsin and Minnesota. Scandinavian ancestry is represented in western Wisconsin and northeastern Iowa (principally Norwegian), Minnesota (principally Swedish and Norwegian), and there are many colonies of Danes. Persons of Dutch ancestry practice intensive dairying in western Michigan and in part of lake-shore Wisconsin, Welsh in numerous areas (one of the most intensive dairy areas of Waukesha County, Wisconsin, is in a Welsh community), Italians in portions of New York State, Poles in north-central Wisconsin, and Swiss in parts of southwestern Wisconsin. Practically all components of the American population (except the Jewish, Oriental, and Negro) are represented.

"Conditioning" to dairying is undoubtedly of more importance than ancestry at present. A dairy farmer tends his cattle 365 days a year, milks them twice a day, and has an evenly spread work year —crop production and milking during the summer—barn feeding and milking during the winter. There are no vacations. Those individuals who are willing to engage in this form of livelihood do so. Most of the present farmers of the region have been brought up to it as part of their life pattern, and accept an industry started by their forebears in response to environmental factors they themselves understood, or had explained to them by the various Agricultural Experiment Stations, nearly all of which promoted the industry in their regional environment.

The Dairy Farms

The American Dairy Region is an area of family-sized farms. Thruout the area farms of approximately 120 acres in size are most numerous. Statewide averages also total at or near this figure.

The region as a whole thus contains farms that are somewhat smaller in acreage than the farms of the central and western Corn Belt, but farms that are somewhat larger than the common operating unit of the Cotton Belt, or the eastern (Ohio-Indiana) portion of the Corn Belt. In actuality, while the 120 acre farm is very common in all of the Dairy Region, any one portion usually consists of a combination of 80, 120, and 160 acre farms. Landholdings much larger than a quarter section are not very common except in a few localities. When compared to many American agricultural regions, the Dairy Region is intensively utilized. On a dairy farm the operator utilizes *labor* rather intensively, *land* rather extensively. His work-hours per month are essentially the same, summer and winter. In this respect the Dairy Region differs markedly from crop-farming areas where the growing season is the busy one.

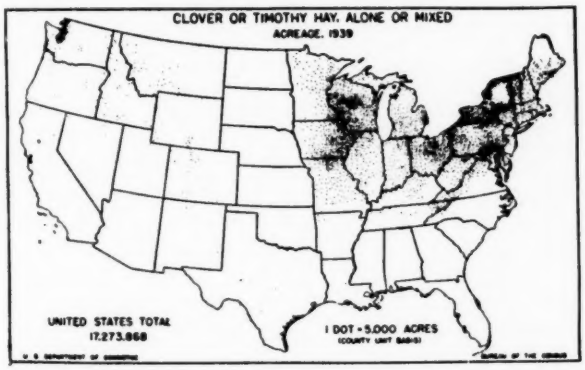

Fig. 3. The American acreage of clover and timothy hay is confined principally to the cool Dairy Region, and the adjacent northern portion of the Corn Belt.

The Dairy Region ranks high in ownership of farms. Only along its southern border is there much tenancy. In part this is owing to the quality of the land—many farms will not support an absentee owner in addition to a tenant—and in part it is owing to the very nature of the enterprise. Tenants are not as a whole trustworthy with highly bred cattle, are not always willing to engage in the consistent year-long labor that dairying entails, and many landowners are unwilling to trust them with their animals. The result of this is that a common practice, where farms are rented, is for the tenant to own his own livestock outright, or have chattel mortgages on them. A high proportion of tenants in most regions are relatives of the owner, very often a son-in-law. The ordinary dairy farm of the Dairy Belt is thus family-operated, usually with the aid of a hired man who lives and boards in the family

homestead. The hired man is often a year-round institution; there is as great need for him during the winter feeding season as during the summer crop season.

Dairy farms that are operated by paid managers are usually near the large cities of the Dairy Region, and especially near the urban communities of the Eastern Seaboard. The majority of these farms are country estates, or hobbies of wealthy business men. The herds maintained on these farms are often very large in numbers. This type of farm is not to be compared to the usual family farm because, during many individual years, the maintenance of the farm and herd is from monies earned in urban centers.

The large barn, silo or silos, and other pertinent outbuildings of the Dairy Region provide it with its characteristic appearance. Other landmark characteristics, such as the night pasture, and many similar observable features, too numerous to mention in a region-wide survey, distinguish the farms of this type-of-farming area from farms of other agricultural regions. Generally good buildings, well painted and in excellent repair, also reflect the high standards of most farmers of the region, and the stable monthly income provided by the milk check—dairy farming is one of the few rural occupations in this country that yields a monthly rather than a seasonal supply of money.

The Dairy Cattle

The dairy cows of the American Dairy Region are all of breeds of European origin. Practically every northwestern European breed except some of the French are represented. The main breeds are the black and white Holstein-Frisian, the golden brown or fawn and white Guernsey, the yellowish-brown Jersey, the light-brown Brown Swiss, and the long horned brown and white Ayrshire. Other breeds, such as the Dutch Belted, are represented in smaller numbers. Toward the southern margin of the region, where corn can be matured without difficulty, some farmers maintain dual purpose cattle (i.e., suitable for both milk and beef), such as the Milking Shorthorn.

The Holstein is the most widely distributed dairy cow of the region, and is usually most numerous in any area. This breed, largest of the dairy cattle, is noted for the quantity of its milk, but not for high butterfat content. The Holstein is the main breed in fluid milk producing areas, where milk is sold to the cities or to condenseries, and in cheese-producing sections. In the former areas

the emphasis is on quantity of milk, and Holstein milk more than meets the specifications of butterfat content for city markets. The Ayrshire is also a breed well suited to city market milk production. In cheese regions, likewise, Holsteins predominate because whole milk is sold to the cheese factory.

Guernseys and Jerseys produce less milk per animal, but milk of high butterfat content. They are numerous in creamery districts

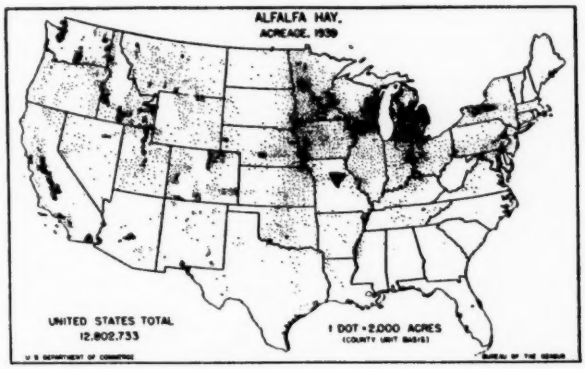

Fig. 4. Alfalfa hay is especially significant in the western part of the Dairy Region, and in Michigan.

where butter is manufactured, and are also on specialized farms of many city milksheds where their milk is sold under the respective breed name. The Jersey is relatively not so important in the Dairy Region as it is in other, and warmer, portions of the United States. Because of this breed's ability to withstand heat better than most other dairy cattle, it is the common dairy animal of warm regions, such as the southern United States.

The average-sized dairy herd of the Dairy Region varies considerably from locality to locality. Herds within the more intensive areas consist of twenty to thirty cows per farm. Some districts have farm herds as low as ten. The average Wisconsin farm has about fifteen milk cows and five to eight heifers, but these statewide figures are composed of widely varying localities, and many farmers of the more intensive areas milk as many as thirty cows. Near city markets, and not usual except in these locations, some producers of specialized milk have herds of 100 or over. Two of the most concentrated dairy areas, so far as numbers of cows and intensity of production are concerned, are middle New York State, and the area of southeastern Wisconsin and northeastern Illinois.[2]

[2] Loyal Durand, Jr., Dairy Region of Southeastern Wisconsin and Northeastern Illinois, *Economic Geography*, Vol. 16, 1940, pp. 416-428.

THE DAIRY PRODUCTS

The dairy farmer's income is derived principally from the sale of milk, and associated livestock products such as cattle and veal calves. Milk may be sold as city market milk, to cheese factories, condenseries, creameries, powdering establishments, malted milk factories, casein plants, and other outlets.

The sale of fluid milk to cities is rather directly related to adjacency to the city, and involves as steady an output per farm as possible. The market milk farmer must arrange his breeding and freshening periods (it requires nine months after breeding for a cow to freshen) in such a manner that he is milking about the same number of cattle each month. This involves heavy feeding costs during the barn-fed season of winter. Despite efforts to spread production most cities receive a flush supply of milk during May and June when pastures are most succulent. This "surplus milk," as it is called, is used in manufacture, or is made into cottage cheese (4 per cent to 19 per cent fat content, and not therefore included in figures of cheese production). Another source of milk for cottage cheese is provided by the daily unsold portion of bottled milk.

The sale of milk to manufacturing plants involves the use of the farmer's milk for butter, cheese, or some other product. Milk in this case is a raw material. Manufactural areas within the dairy region are commonly at a considerable distance from the urban markets. Whole milk is delivered to condenseries and cheese factories. Only the cream is delivered to creameries for use in butter manufacture, altho many large creameries now purchase whole milk, separate the cream for butter, and engage in the production of dried or powdered skim milk.

SUBDIVISIONS WITHIN THE DAIRY REGION

The fundamental subdivision, based on type of product within the American Dairy Region, is that between (1) an eastern market milk area, and (2) a western manufactural milk area. The major reason for the subdivision is the general adjacency of the eastern portion of the region to urban markets of large size, and the general remoteness of the western portion of the Dairy Region from such markets. There are local regional exceptions in each case—upstate New York still produces considerable quantities of cheese, and southeastern Wisconsin supplies three-quarters of the market milk for the Chicago-Milwaukee metropolitan district.

THE MARKET MILK AREAS

Three major types and locations of market milk areas are distinguishable. They are (1) in the immediate vicinity of any city of the region such as Rochester, New York, or Grand Rapids, Michigan, (2) thruout the eastern portion of the Dairy Region, serving many cities, and (3) in northeastern Illinois and southeastern Wisconsin, serving the five million urban inhabitants of the western shore of Lake Michigan. The second location mentioned includes the dairy lands of wide areas. The Boston milkshed includes parts

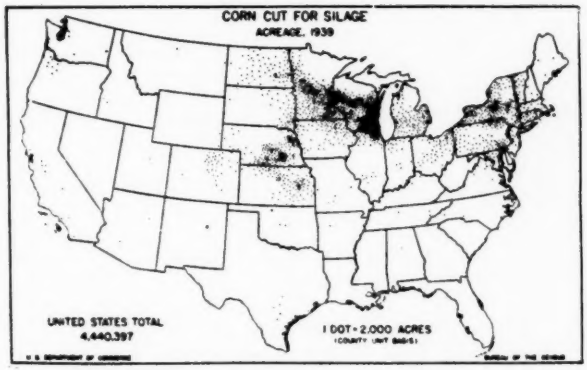

Fig. 5. Wisconsin is the center of production of silage corn. Some counties harvest more than 90 per cent of their corn in this way. Many counties of southeastern Wisconsin average more than one silo per farm. The American Dairy Region and eastern Nebraska contain nearly all the silage corn acreage of the United States.

of Massachusetts, Maine, New Hampshire, and Vermont. New York City draws milk from much of New York state, northward in the Hudson-Champlain Valley to the Canadian border, and west to the west-central counties. Philadelphia milk is drawn even from the northern counties of Pennsylvania. Cleveland, Akron, and the other cities of northeastern Ohio are supplied with market milk by this portion of the Dairy Region, and Detroit depends upon large areas of southeastern Michigan for its daily requirements. The numerous other urban centers of the eastern half of the Dairy Region all possess their own milksheds, and complex situations have developed in and near the metropolitan regions, such as the Greater New York area. In general, the former manufactural-milk importance of the eastern dairy region has disappeared before the inroads of the expanding city markets, which pay a higher price for milk than do creameries or cheese factories. The same factors have operated in southeastern Wisconsin and northeastern Illinois. Elgin was once the center of butter production of the country (butter prices are still quoted here), but creameries are now not existent in the area.

The Western Manufactural Dairy Area

The manufactural portion of the American Dairy Region includes most of Wisconsin, northwestern Illinois, northeastern Iowa, and Minnesota. These dairy regions to the west of Lake Michigan contain some of the largest concentrations of cattle with respect to area in the United States. Milk and butterfat production is great, and is very large per unit of area. Because this portion of the Dairy Region is far removed from the urban demands for market milk, the milk is manufactured into a concentrated product that is higher in value per unit of weight, one that will bear the shipment costs to distant markets. A similar small sub-region of the same manufactural type exists in northern New York state, northwest and north of the Adirondacks and east of Lake Ontario, removed from the metropolitan markets by both distance and the mountain barrier.

Butter. The main butter-producing area of the American Dairy Region is the so-called Tri-State Butter District of western Wisconsin, northeastern Iowa, and eastern and southeastern Minnesota. Creameries of the villages receive cream two to three times weekly from their farm neighborhoods. The cream is manufactured into butter, which is sold nationally. Receipt and price quotations in the metropolitan dailies list the product as "Tri-State Butter receipts." Private and co-operative creameries engage in production. Some of the largest and most influential of American co-operatives are headquartered in this portion of the Dairy Region. Scandinavian farmers are prominent in numbers thruout the butter area, and many of the creamery operators are Americans of Danish or other Scandinavian extraction.

The regional prominence of the Tri-State area does not preclude other butter-manufacturing districts. Michigan has considerable butter production within its share of the Dairy Region, and there are creamery districts elsewhere, as well as considerable butter production from localities not within the Dairy Region proper.

Butter production is an all-year industry. The bulk of the output is made from sour cream, which can be collected from the farms summer and winter. Manufacture of sweet-cream butter, engaged in by some creameries, involves collection of the raw material two to three times a week during the winter season, and daily during the summer.

Skim milk, the by-product of farm separation of whole milk, is

kept on the farms as direct feed for calves and swine, or is mixed with grain to form a swill for hogs. Butter regions, as a result, usually engage in the rearing of swine.

Cheese. Cheese is manufactured in highly regionalized sections of the Dairy Belt. Because most cheese is made in regions of fairly low summer temperatures, and because milk for cheese manufacture, in contrast to cream for butter manufacture, must be absolutely fresh, many students have assumed that the location of the specialized cheese areas within the Dairy Region itself is a direct relationship to their particular local summer environment. Such, however, seems not to be the case except very locally. Of much more importance are such factors as national origins of the population, the advantage of an early start in cheese manufacture, tradition in the industry, and name and advertising value. Once established, the industry has usually continued in the area. Some of the Wisconsin cheese districts for example, were originally localized by settlers from the cheese areas of Oneida and Herkimer counties, New York, and others were founded by Swiss settlers from Canton Glarus. It is true, however, that but little cheese is manufactured in the warmer-summer, farthest western portion of the Dairy Region in Iowa and extreme southern Minnesota. The cheese regions, by and large, are peopled by farmers of early American, German, and Swiss descent, and the majority of cheesemakers are also Americans of these ancestries. However, Scandinavians and Polish are also numerous in certain cheese subregions.

Wisconsin produces over 50 per cent of the cheese output of the United States. The Wisconsin production originates largely (1) in the Lake Michigan shore counties north of Milwaukee, (2) in a band across the north-central portion of the state, (3) in northwestern Wisconsin, and (4) in southwestern Wisconsin, particularly the southern portion of the Driftless Area. The cheese region of Illinois, the second state in cheese production, lies in the northwestern portion of the state, contiguous to the Wisconsin state line, and is regionally a portion of the Driftless Area production.[3] The midwestern cheese producing region is consequently crescentoid in shape, the horns toward the west, with the Wisconsin portion of the Tri-State butter district included between the horns.

Cheese manufacture is an all-year industry, but May and June

[3] Loyal Durand, Jr., Cheese Region of Northwestern Illinois, *Economic Geography*, Vol. 22, 1946, pp. 24-37.

are usually the flush months of production, and surplus cheese made during this time is stored as "June cheese." Whole milk is delivered to rural crossroads cheese factories by the farmer patrons, or is collected by milk routemen hired by the factory. The milk must be absolutely fresh. Because of the total movement of milk to the factory, the building is usually placed at a rural crossroads in juxtaposition to its source of raw material, and the milk

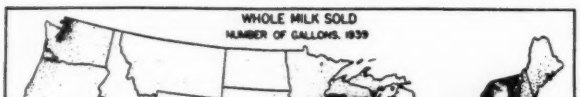

Fig. 6. The map of whole milk sold shows, collectively, the areas of city market milk, condenseries, and cheese manufacture. Compare with Fig. 7. In the portion of the American Dairy Region east of the state of Michigan nearly all the milk leaves the farms in the form of whole milk. The Wisconsin portion of this map, except for the extreme southeast, outlines the principal cheese-producing regions of the state.

to support a factory comes from a remarkably short distance, usually less than six miles, and commonly less than four. This indicates something of the intensity of dairying in the cheese subregions. These are usually areas of more cows per unit area than butter districts, and larger herds per farm. It is not uncommon for cheese factories to operate only with the milk output of a dozen to eighteen farms, and some few operate with milk from only four to eight patrons. Consequently, cheese factories are much more numerous than creameries in a state like Wisconsin. Modern refrigeration, however, permits longer hauls, and there is a marked tendency for consolidation of factories.

Milk for American cheese factories is delivered daily, after the morning milking. Milk for some of the foreign varieties of cheese, such as limburger, is delivered twice a day during hot weather, following both the evening and morning milking, and, pending cessation of this type of weather, the cheesemaker engages in twice a day cheesemaking, from 7 A.M. until noon, and 7 P.M. until midnight. The farmer, after delivering his milk to the factory, returns home with whey, drawn off from the cheese vat after the

curd has formed, and a by-product of the industry. The whey is utilized on the farm for the feeding of swine.

The cheese output of the American Dairy Region is of both the cheddar (American) variety and foreign-type cheese. If it is light-colored or almost white cheddar, and later is well-aged, it is sold as New York cheese, whether made in that state or in Wisconsin. If it is a yellower cheese, it is sold as cheddar (or American),

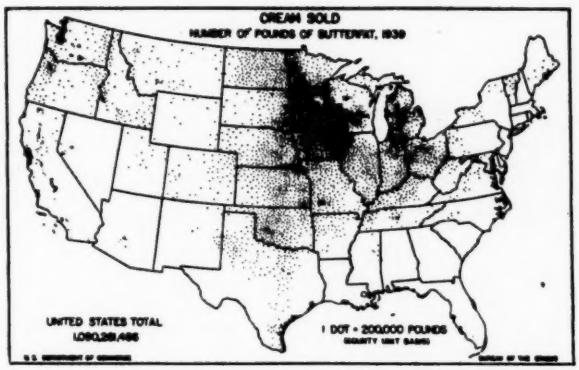

Fig. 7. The outstanding feature of this map is the Tri-State butter region of western Wisconsin, northeastern Iowa, and southeastern Minnesota, the main source region of butter in the United States. Compare with Fig. 6, and note the unimportance of butterfat production in the eastern part of the Dairy Region and in much of Wisconsin. The "hole" in cream production in eastern Minnesota is the Minneapolis-St. Paul milkshed.

whether mild, sharp, or aged. The foreign-type cheese output is divided by type. Italian and Swiss cheese is of most importance after American.[4] The Italian varieties are numerous—asiago, provolone, provolette, gorgonzola, romano and others, the Swiss cheese (marketed under this name) is usually of the gruyère or Emmenthaler type. Besides the two leading foreign varieties, the American Dairy Region produces limburger cheese, brick cheese (called "foreign," altho perfected in Dodge County, Wisconsin, by a cheesemaker who developed a cheese intermediate between Swiss and limburger), French cheese, Greek cheese, rouquefort-type cheese such as Blue cheese, and others.[5]

Wisconsin manufactures half the nation's out-put of American cheese, and from 80 to 90 per cent of differing foreign varieties.

[4] Loyal Durand, Jr., Italian Cheese Production in the American Dairy Region, *Economic Geography*, Vol. 24, 1948, pp. 217-230. See also Glenn T. Trewartha, The Green County, Wisconsin, Foreign Cheese Industry, *Economic Geography*, Vol. 2, 1926, pp. 292-308.

[5] Loyal Durand, Jr., Cheese Region of Southeastern Wisconsin, *Economic Geography*, Vol. 15, 1939, pp. 283-292.

Northwestern Illinois makes most of the Swiss cheese not made in Wisconsin. Upper Michigan manufactures Italian as well as American cheese. New York, third state in total cheese production, manufactures American and Italian cheese, and the portion of the country's limburger output not made in Wisconsin. The New York cheese regions are (1) in central New York, (2) in the far western end of the state, and (3) in the St. Lawrence Valley east of Lake Ontario and north of the Adirondacks.

Process Cheese. Process cheese is a remade cheese. Its raw material is already-made natural cheese. The processors obtain much of their supply of natural cheese from the Dairy Region, grind it, and process it. The result is a uniform product, chemically controlled, whereas natural cheese varies in quality from factory to factory, season to season, or does not always cure the same. Some processors operate their own natural cheese factories, then immediately grind their output for processing. Process cheese is marketed in uniform packaging, and has become a principal sales item of American groceries. The packages must be marked "process cheese."

Canned Milk. Condensed and evaporated milk is canned at large plants called condenseries. These are usually located in the towns and small cities of the region—a type of location comparable to that of creameries, but unlike that of cheese factories. An individual condensery represents a large capital investment. It is commonly corporation-owned, in contrast to the private and cooperative creameries and cheese factories. Each individual condensery requires a large milk supply. Preferably the haul should not be too long, because whole milk is transported to the plant. Thus a key factor in condensery location is to pick an intensive dairy district, one that has a large milk production per unit of area. The overall dairy region offers many such locations, and New York, Michigan, and Wisconsin are leading condensing states, the latter first in production. Because condenseries are newer outlets in the dairy scene there is usually not such a concentration of them in any one area as there is of cheese factories and creameries. Moreover, they have been located after districts have attained a considerable peak of dairy intensity, hence they have often been established in pre-existing butter and cheese areas. Their larger size, abundant capital, corporate connections, and efficient management have usually permitted them to compete successfully with the smaller dairy plants, and they have often forced the latter from the competitive market.

Two notable areas of condensery concentration are in southeastern and northwestern Wisconsin. The former area has been invaded by the Chicago milk market, with resulting competition for milk between the urban distributors and the condenseries.

Other Dairy Manufactures. Specialized dairy products manufacture, such as the production of malted milk, is engaged in by some plants. Many other products are by-products, however, of a creamery, cheese factory, or condensery. Among some of these are dried whole milk, concentrated skim milk (for both human food and animal feed), condensed or evaporated buttermilk, dry buttermilk, plastic cream, dry cream, dry whey, dry casein, and ice cream mix. The tendency in construction of present-day dairy plants is to provide a multi-purpose plant, one that can produce several products, or shift production from one product to another in response to market demands.

Ice Cream. The manufacture of ice cream is considered a part of the dairy industry. While the Dairy Region contributes large amounts, the key locational factor in this division of the industry is location at the market. The large cities, wherever located, are thus the principal producers. The ingredients used in the manufacture, however, may originally have come from the Dairy Region. If in the form of dried or powdered milk or cream, or ice cream mix, the source may be the western manufactural portion of the region.

Long Distance Milk and Cream Shipments. The western, manufactural portion of the Dairy Region is the only major source of milk and cream that cities can draw upon when their local supplies are diminished, or if their local supplies do not adequately meet their needs. When these exigencies occur, milk is diverted from manufactural use to market milk use.[6]

Cream, either in "whole-form" or in a specially concentrated jelly-like form known as *plastic cream,* is shipped daily from Wisconsin, Iowa, and Minnesota to such distant markets as Boston, New York, and Philadelphia. Milk from Wisconsin is shipped daily in tank cars to these same areas if needed, and, during the winter tourist season, fresh milk from Wisconsin is dispatched to Miami, Florida, and other resort towns whose local milksheds are unable to meet the seasonal demand. During the War shipments from Wisconsin went to nearly all southern cities. War-boom communities, such as Knoxville, Tennessee, and its satellite city, Oak

[6] Loyal Durand, Jr., Recent Market Orientations of the American Dairy Region, *Economic Geography,* Vol. 23, 1947, pp. 32-40.

Ridge (which grew to a population of 80,000 from nothing in two years), had to obtain over 40 per cent of their day to day milk supply from Wisconsin, and during the winter obtained as much as 55 per cent from this source region. Modern refrigeration and rapid transportation have made possible these long distance shipments, and have modified the oft-repeated economic statement that "a heavy, bulky, perishable product such as market milk is produced immediately adjacent to the market."

DAIRYING OUTSIDE THE DAIRY REGION

The purpose of this paper is not to discuss the nationwide pattern of dairying. In order to complete the picture, however, dairying sections that are not parts of the agricultural region will be mentioned briefly. These may be grouped into some seven subdivisions.

(1) The Temperate Marine lands of the Pacific Northwest offer an ideal environment for hay and pasture, and for a consequent dairy industry. The setting is comparable to that of the intensive milk-producing areas of northwestern Europe, but the lowland areas of this type in the United States are limited in acreage. The industry is of great importance in the Puget Sound Lowland of Washington, and in the coastal valleys that open directly to the Pacific in Washington, Oregon, and northern California. Surplus milk is available for manufacture. Condenseries are features of the Washington dairy lands, and the cheddar cheese manufactured in the Tillamook Valley of Oregon is marketed as "Tillamook cheese." It is common in all West Coast markets. Condensed and evaporated milk from the Puget Sound Lowland is exported in quantity, or enters the "coastwise" trade with the Territory of Hawaii.

(2) The irrigated lands of parts of the Great Valley of California maintain many dairy cattle. California ranks high in the output of condensed and evaporated milk.

(3) The eastern Indiana-western Ohio portion of the Corn Belt has a large dairy-cow population, and is important in milk production. In part this is a response to the numerous cities of these two states, located in the region mentioned, and in part a response to the small-sized farms of this portion of the Corn Belt, a factor promoting more intensive use of the land.

(4) The western Corn Belt is a large producer of butter. In fact, Nebraska is the fourth state in American production. This is the so-called "Centralizer Belt," which stretches along the plains

border from eastern Kansas to eastern North Dakota. Cream from a very large area is shipped to large creameries, known as Centralizers. No one farm contributes much, maybe only a can or two per week, but collectively the butterfat output is important, and individual Centralizers may draw their supplies from two hundred miles or more. Long distance shipment is made possible because of the fact that the butter is manufactured from sour cream. It would be impossible to manufacture cheese under these conditions. This phase of dairy manufacture extends into the Corn Belt portions of Iowa and, in conjunction with the butter production of the northeastern dairylands of Iowa helps place the state first in American butter output.

(5) Southern dairying is widely scattered, and not concentrated as a whole. Country butter is still churned on Southern farms, and marketed at local groceries. The most spectacular rise of dairying in the South recently has been in the limestone grasslands of the Nashville Basin of Tennessee, particularly in its southern portion. The Springfield portion of the Ozarks in southwestern Missouri also contains a leading dairy industry, and is an important area of cheese manufacture.

(6) The general farms of Southeastern Pennsylvania and Piedmont Maryland all have dairy herds as part of their varied economy. Part of this district is as important in milk production as are portions of the Dairy Region proper. Whole milk is sold to the nearby metropolitan centers of the Philadelphia-Wilmington-Baltimore-Washington urban region.

(7) Every city, no matter where located, has some dairy farms in close proximity to serve the city market. Local dairy farmers, like market gardeners, are thus the immediate neighbors of urban inhabitants. Some very large cities, outside of the Dairy Region proper, consequently localize very considerable concentrations of dairying, an example in point being Los Angeles, and Los Angeles County, in part because of its size, is the leading milk-producing county of the entire United States.

SUMMARY

The American Dairy Region is a well-defined agricultural region of the United States. Its general limits have been set for some time, and correspond roughly with the American region of Humid Continental Short Summer (Dfb) climate. A large share, but not all, of our milk production originates within this region. The farmers of the eastern half of the region engage primarily in market milk

production, and sell whole milk to the numerous cities. The farmers of the western dairy manufactural half of the region sell butterfat to creameries or whole milk to condenseries and cheese factories. The Dairy Region does not end at the Canadian border, but continues northward into peninsular Ontario and the St. Lawrence Valley of Canada.

CONSERVATION EDUCATION OR TRAGEDY*

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Never before has civilized man the world over been confronted with problems more paramount than that of effecting continuing peace among divergent peoples and that of establishing harmonious relations between man and his life-sustaining natural resources. Steps leading toward the resolution of one of these problems will greatly facilitate the resolution of the other. Thus, for survival man must concern himself with the vital issue of the wise use of his natural-resource base.

Urgency of the Situation

Natural resources form the basic foundation upon which any civilization rests. History is filled with the records of people who rose to great heights as they consumed and exploited their resources; but those self-same civilizations waned into decline and many eventually into decay and obliteration when the support for their existence, the life-sustaining natural resources, disappeared either thru ill-use or abuse.

The findings of W. C. Lowdermilk, as stated in "Conquest of the Land Through Seven Thousand Years," point conclusively to the relation between man's use of the land and the permanency of his civilization. The excavated ruins of mighty Babylon, long buried under the sands of Mesopotamia, bear mute evidence of the failure of man to effect a lasting adjustment to the land. When the irrigation ditches were permitted to fill with silt, they could no longer water the lands that supported the city; and Babylon, the capital of most of the civilized world of only 4,000 years ago, died

* Presented at the Chicago meeting of the National Council of Geography Teachers, November, 1948.

and remained dead. Antioch, buried under eighteen feet of silt; Tarsus, removed from its seaport position to ten miles inland by an ever-extending delta; the ruins of more than a hundred dead cities of north Syria, left standing like stark skeletons on bare rock base from three to six feet below the doorways; and the Yellow River, confined in channels high above the surrounding landscape, are all indicative of the tragedy of man's misuse of the land.

Yet, in spite of the convincing records which reveal that the fate of the decadent civilizations was associated with or resultant from the destruction of the means of their subsistence, civilized man is making today most dangerous inroads on the natural-resource base—dangerous to his national defense and security and dangerous to human welfare. With a population ever increasing, with human wants multiplying, with technology greatly altering the "balance of nature," and with two major resource-consuming world conflicts during the span of one generation, the depletion of the world's resources is proceeding at a rate never before equaled in the history of mankind.

The urgency of the problem becomes more apparent upon consideration of impact of the following:

1. The carrying capacity of the earth is declining.
2. The population of the world is surging upward.
3. The globe is well occupied.
4. Science is not all-sufficient.

DECLINING CARRYING CAPACITY OF THE EARTH

Impoverishment of the natural resources has followed the historical march of man. Yet, with the accelerated resource-destruction of the twentieth century, the earth is fast declining in productivity. Landscapes, dotted with abandoned farmsteads; dams, chocked or completely filled within a few years after construction; fishless streams, laden with sewage and industrial waste; denuded hillsides, stripped of their once fertile soil; underground water-levels, sunk many feet below former positions; flood peaks, greatly raised during the last century; timber and grazing lands, shrunk to a small portion of the original acreage; and ghost-towns, deserted as they no longer can support life or reward man for his labor, are only a few of the symbols indicative of the growing impoverishment of the earth.

The destruction of our natural heritage in the United States is proceeding at tragic rates. We are losing half a million acres

of crop land each year as the result of wind and water erosion and bad practices. The estimated annual cost of soil exploitation, as stated by Bennett and Pryor, is $3,844,000,000. Three billion of this amount represents the loss of three billion tons of soil materials. With one-third of our original nine-inch layer of top soil washed or blown away, we are then, as Fred Bailey entitled his article, "six inches from starvation." Furthermore, with increasing world responsibility, the farms of the United States are producing approximately 40 per cent more than before the war; but, according to a January, 1948 report of the Production and Marketing Administration of the United States Department of Agriculture, the losses from erosion and waste exceed the gains from improved farming practices even at inflated prices. Of our original saw timber stand, less than one-fourth remains. The drain on forests for 1943 exceeded the estimated growth by 50 per cent; while in saw timber, the drain was approximately twice the annual growth. Our demand upon the underground water supply for 1947 was twice that of ten years ago. These are only a few of the indices that might be selected to indicate our trend.

The habitable areas of the globe are receiving the impact of two forces which augment each other. These areas, thru steady impairment of natural resources, are becoming less able to support the population. Furthermore, they are constantly becoming more crowded as a result of the modern "population explosion," which in turn puts "a greater demand for productivity on the increasingly unproductive land." Herein lies a grave threat to civilization —that of a lowering standard of living, the evils of which will endanger human welfare and, no doubt, engender future wars.

Increasing Population

A primary factor related to the wide-spread destruction and impairment of resources is the rapid increase of the world population with its accompanying pressure for subsistence upon the earth. Only three centuries ago, the total population was 400,000,000—a striking contrast to the present 2,200,000,000, an increase of five times. Still more startling is the fact that within the last century the population has doubled. In his recent book, *Road to Survival,* William Vogt places the net daily increase in the population of the world at 50,000. Putting it differently, Fairfield Osborn maintains that if the present rate of increase of approximately one per cent per year continues, it will mean a doubling of the present world

population in about seventy years. However, he warns that changing conditions in many countries will obviously affect the rates of increase.

Notwithstanding the tragic number of lives lost as the result of World War II, it is estimated that the population of the world has increased over 200,000,000 since Hitler's march into Poland on September 1, 1939. The gain in population during this period in Europe alone is estimated to be over 20,000,000. Apparently, the world is becoming "a sanctuary without exits for a fast breeding human race."

A Well-occupied Globe

How man with his increase in numbers makes use of the Mother Earth will be a paramount factor in determining the character and degree of permanency of his civilization; for twentieth century man, unlike that of past centuries, finds the habitable areas of the globe well occupied. As Osborn points out, "Man's inheritance of the earth is now in truth a completed fact, but as an heir he has . . . already destroyed a large part of his inheritance. He has failed so far to recognize that he is a child of the earth and that, this being so, he must for his own survival work with nature in understanding rather than in conflict." Consequently, in the wake of man lie barren wastelands to which on-coming people cannot turn for their subsistence.

That the ratio of land to man is, in many habitable areas, very unfavorable is indicated by the fact that one-half of the population of the earth live on one-twentieth of the total land area. According to an estimate made by the United States Department of State, the remaining amount of arable land for the entire world is four billion acres, a little less than two acres per person. Pearson and Harper, after considering the portions of the earth that have a favorable combination of temperature, moisture, soils, sunlight, and other factors, give a more conservative figure of 2,600,000,000 acres as the total amount of land suitable for food production. This means only a little more than one acre for each person. Yet, nutrition specialists maintain that anything less than two and one-half acres of land of average productivity is inadequate for providing even the minimum essentials necessary to sustain one person in good health for one year. In striking contrast to this needed ratio is that of .88 acres of arable land per person for Europe. Germany with less than one acre of arable land per capita tried desperately

to gain more. Italy made efforts to add to its three-fourths of an acre. Likewise, Japan with only one-fifth of an acre of arable land per person keenly felt its need for more and turned to aggression as a way out. It failed, and it still feels the sting of a population grown beyond its means of adequate subsistence.

An examination of the ratio of cultivatable land to man for various countries reveals a significant advantage of the United States with approximately three acres per person. Such a study also indicates that if our citizens continue in their apathy toward conservation and, thereby, extend the period of living on the "resource capital," we cannot—like our forefathers of old—find new, fertile frontiers into which we may move to escape the disastrous effects of suicidal agriculture. Either we must eventually face the fatal consequences of depletion of our resources, or we must put forth every effort to solve the problem on the land we have. The fertile, habitable lands are occupied.

The Insufficiency of Science

As migration to new lands no longer provides escape from the direful results of man's misuse of his Mother Earth, some individuals engage in wishful thinking and name science as the complete answer. Modern science with all of its marvels is not a substitute for a sound ecological balance.

It is suggested by some that, after soil destruction is widespread, man will produce his food by hydroponics—a method of growing plants in water charged with chemicals. But this is by no means a new process. England developed it, tho in a crude way, approximately two hundred years ago. Altho this method was used in strategically important areas during the war, large-scale plant production by hydroponics has never been accomplished. Furthermore, those who best understand its complexities keenly question its practicability.

On the other hand, some individuals, with their faith in the bounty of science, maintain that substitutes for necessary materials will be supplied when needed. But George Renner insinuates a disquieting note when he observes, "Science has given us an imposing array of substitutes for many materials, but for every substitute discovered, two or three new uses have been invented."

Surely, it must become recognized that science, with all of its potentialities, cannot eradicate the tragic effects of an ill-used, depleted resource-base. If civilization is to escape decline or per-

haps destruction, society must, in the apt words of Lowdermilk, "be born again out of an economy of exploitation into an economy of conservation." For this rebirth, a sound conservation program is imperative.

A Sound Conservation Program

A conservation program to be dynamic must be so implemented that its principles become a part of the thinking of all the citizens. It must be so designed that it rests, as William Vogt expressed it, "like a tripod on three legs: research, education, and action on the land." These three aspects functioning simultaneously are absolutely indispensable to any program of conservation. Of course, it is in the action on the land that the effectiveness and also the ultimate value of the other aspects are realized. But there can be no such action program without proper education based upon careful, thorogoing, scientific investigations.

The knowledge and findings of the natural scientists must be related to the every-day living of the people; they must be translated into values that make ecological health not only a matter of concern to the people, but also an objective for the attainment of which the citizens work co-operatively together. Herein lies the challenge to all persons and agencies engaged in supplying information to the public.

Conservation Education

The permanency of our civilization and the progress, stability, and destiny of our nation are vitally related to the degree to which this challenge is met. For conservation to be significantly furthered in a democracy, conservation education of *all* the citizens is imperative. The ultimate success of any conservation program is greatly dependent upon public opinion; and public opinion is created thru education.

In a democracy, no approach to the problem of wise use of natural resources can be effective unless it seeks to develop an informed citizenry, adequately aware of the problem and cognizant of the dependency of human welfare upon life in harmony with the earth. The people must have knowledge of the environment and of the complex of interrelationships. This is essential for initiating better resource-use practices. The citizens must have desirable attitudes toward conservation problems, policies, and practices. They must be sensitive to resource misuse and to the vast amount

of knowledge and experience available which may be used in the solution of their problems. Moreover, they must be self-disciplined individuals, capable of making choices in the light of their social responsibilities rather than their immediate individual gain. The acquisition of these qualities and abilities by a dominant portion of our population is a prerequisite to a dynamic role for conservation.

Notwithstanding the significant gains that have been made in conservation within the last decade, the average citizen is too little concerned about problems of resource use. This is partially associated with the fact that 56.5 per cent of our population live in urban areas. The resulting detachment from the land seems to deaden interest in the natural resources. Moreover, widespread apathy toward conservation is reflected in the fact that of our total national income for 1945 approximately one-half of one per cent was spent on conservation research, education, and operations. Further evidence of prevailing complacency is apparent when we consider that of over 1,000 foundations in the United States, only two are devoted to renewable natural resources.

For arousing nation-wide conservation consciousness and for effecting immediate action of remedial measures, educational approach must be made thru every suitable media including, among others, the press, the radio, movies, posters, adult groups, and youth organizations. On the other hand, to bring about an understanding of the ecological relationships necessary for living in harmony with the earth and to orient the citizens to the recognition of individual responsibility, a long-range program of education is indispensable. This paramount responsibility must be assumed by the school, the home, the church, governmental and non-governmental agencies, and public leaders.

If conservation permeates our educational programs, we may have an ever-increasing number of self-disciplined citizens, cognizant of the value of the natural resources, sensitive to their misuse or abuse, and able to work together in a democratic manner to effect programs of conservation. This is essential to the preservation of human welfare, to the perpetuation of our nation's strength, and to the maintenance of its military potency.

Indeed, conservation alone is not going to bring the desired solution for the major ills of the world or of our nation. Other measures including those of economic and political nature are indispensable. However, unless all who influence public opinion seek

to establish a program effecting harmonious relations between man and his habitat, we shall surely, "sit down to the table of consequences."

GUAM—FOCUS OF THE WESTERN PACIFIC

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Prior to the Second World War, Guam was a little-known island in the western part of the Pacific Ocean. Today, it is the administrative center for the Trust Territory of the Pacific.[1] Failure of the United States Congress to permit fortification of Guam prior to the war, meant that the island had no wartime significance, and this, in turn, was the principal factor in the American defeat in the Philippines.[2] Since the war, the island has become the site of American naval, military, and air bases second only to Pearl Harbor, Hawaii.

LOCATIONAL CHARACTERISTICS

Guam is the largest and most southerly member of the Marianas—an island chain whose arc forms the eastern rim of the Philippine Basin. It lies 1,500 miles south of Tokyo and an equal distance north of Australia; 1,250 miles east of Manila and 9,500 miles west of Panama. In other words, an east-west line from Panama to the Philippines, a north-south line from Japan to Australia, and diagonal lines from Samoa to China and from the United States to Indonesia, all intersect at or near Guam. In the future, therefore, this is bound to be the most strategic spot in the western Pacific.

Guam itself is a picturesque bit of land, roughly thirty miles long and from four to eight miles wide, and its area is 206 square miles (Fig. 1). Its nearest neighbors are Rota, Tinian, and Saipan—located 30, 120, and 125 miles to the north respectively.

[1] The Trust Territory consists of the former Japanese Mandated Islands, viz. the Marshalls, the Carolines, the Palaus, and the Marianas other than Guam. In April 1947, the United Nations Security Council placed the ex-mandated Islands under United States trusteeship.

[2] See the speeches of the "isolationist" members of the Congress in the *Congressional Record* from 1930 to 1940.

PHYSICAL CHARACTERISTICS

The southern half of Guam is volcanic and hilly, rising to 1,334 feet atop Mt. Lamlam. Numerous streams have cut wide valleys to the sea and have built small alluvial plains—particularly along the eastern margin. These latter are fertile and intensively cultivated.

The northern half of the island consists of a broad coralline limestone plateau. It stands 600 feet high at the northern end, but it declines to about 100 feet to the south. It was formerly wooded with ifil (*instia bijuga*), daog or palo marin (*calophyllum inophyllum*) a variety of the seeded breadfruit. The level and more arable tracts were formerly planted in corn, vegetables and coconuts; but they have now been converted into military reservations.

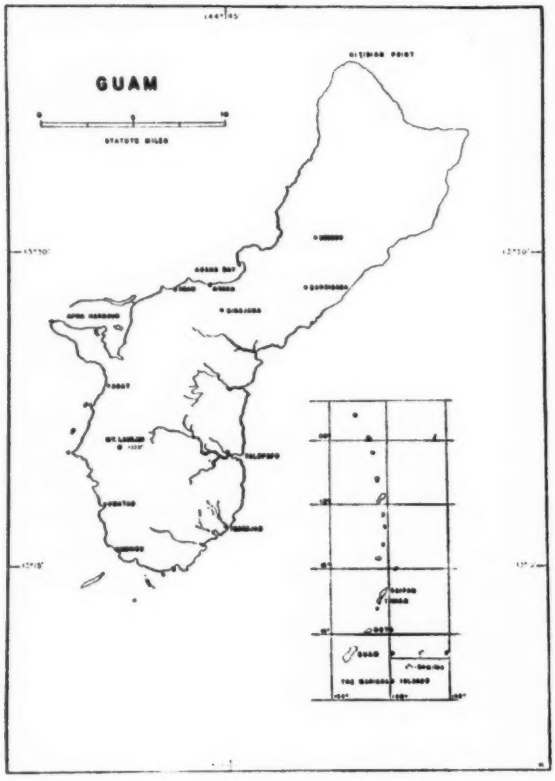

FIG. 1. Guam

Guam is almost encircled by a coral reef. The passages thru this have been deepened by blasting in order to provide entrances to the two harbors—Apra and Agana—on the western shore. The enclosed lagoon, except where contaminated by sewage from ships and military installations, provides good fishing grounds. Altho the waters abound in fish, since the Guamanians have lost the art of making seagoing canoes,[3] they rarely engage in fishing activities. Turtles, shell-fish, tunny, and mackerel are numerous in both off-shore and lagoon waters, but fishing on a commercial scale has

[3] Bryan, E. H., Jr., "The Fishes of Guam," *Guam Recorder*, December 1938.

not been successful in spite of attempts by naval administrators to popularize the industry. Many families living on the seashore catch lagoon and reef fish for local consumption.

CLIMATE AND SOILS

Guam has a pleasant oceanic variety of the Monsoon Tropical type of climate. It shows very little seasonal variation in temperature, considerable variation in relative humidity, and very marked variation in precipitation (Fig. 2). Temperatures ordinarily vary from 83° to 79°. A maximum of 95° and a minimum of 64° have been recorded in June and in February respectively.

Two-thirds of Guam's average annual rainfall of 91 inches falls during the monsoon period, July to October. A relatively dry season occurs from November to June, during which time the Northeast Trade Winds prevail.

Fluctuations in relative humidity are particularly stimulating and welcome. A high relative humidity becomes very debilitating and enervating after a few weeks. The high humidity is accentuated by the presence of clouds a great deal of the time. Frost, snow and hail are unknown.

Typhoons are usual occurrences, but few of them do serious damage, except to the coconut palms. Some of them, however, may be devastating, as was that of September, 1946. Houses are not built in adjustment to typhoons as they are in the Caroline and Palau Islands.

The soils, products of normal erosional processes, are mostly of two general types;[4]

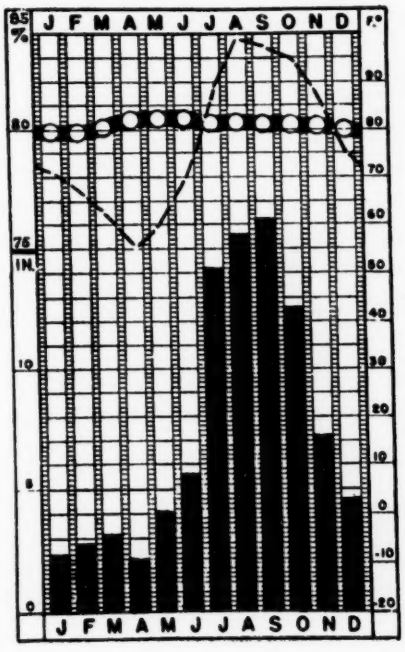

FIG. 2. Weather chart for Sumay, Guam, on the peninsula south of Apra Harbor. Rainfall and relative humidity are indicated and the left hand side and temperature on the right hand side of the chart.

the heavy alluvial clay forest soils of the valleys and the flat coastal areas, and the porous residual limestone soils of the plateau, some of which were developed under grassland cover. The clay soils are often only six or eight inches in depth, but the limestone soils are generally even shallower and are underlain by a coral subsoil. The heavy soils are difficult to work in either wet or very dry weather. The limestone soils dry out quickly after rains but do not crack like clay soils. Both soils when newly cleared are generally quite fertile, but continued cropping soon depletes the supply of available nitrogen, phosphorous, and potash, necessitating abandonment of the land, under Guamanian farming practices, after a few years of cultivation. The rapidity with which undergrowth springs up over most of the island, makes constant clearing necessary if any semblance of tillage is desired.

Guam's location, some 700 miles north of the Equator, its tropical oceanic climate, its soils capable of supporting varied crops, and its very sizeable local market, all combine to encourage the production of foodstuffs. Despite this, a considerable amount of arable land lies fallow on the island.

THE GUAMANIAN PEOPLE

Little is known of the history and origin of the Islanders, but it is probable that the ancestors of the present day 25,000 Chamorros or Guamanians, as the inhabitants of Guam are known, were part of the several waves of Polynesian peoples who spread eastward by large outrigger canoe from the Philippine Islands and peopled the Western Pacific. Sanvitores[5] wrote, "The indigenous inhabitants of the Marianas were tall, big-boned and muscular with tawny skin and long black hair. Their skins are somewhat lighter than that of the Filipinos, their statures are larger, they are more corpulent and robust than Europeans and they have pleasant, agreeable faces. . . they remain in good health to an advanced age and it is very normal for them to live to ninety or one hundred years. . . and the women are more delicately formed and lighter complexioned than the men."

Today there are few if any unmixed Chamorros on Guam.

[4] Oakley, R. G., "Agriculture in Guam," *Foreign Agriculture*, U. S. Department of Agriculture, Vol. 8, no. 10, October 1944, pp. 215-244.

[5] Garcia, Francisco, *Vida y Martiro de el Venerable Padre Diego Luis de Sanvitores de la Compania de Jesus, Primer Apostal de Islas Marianas*, Madrid, 1683. Translated for the *Guam Recorder*, July, 1938.

Constant contact with off-islanders for the past four hundred years has produced a thoroly mixed strain.

The most recent population statistics (January 1, 1948) are as follows:[6]

Permanent Resident Population of Guam

Guamanians	23,544
Japanese (all or part)	390
American	275
Filipinos	67
Others (Off-islanders)	441
Total	24,717

This total figure does not include a non-resident population estimated at 55,000 comprised of American military personnel and dependents, civilian contract laborers, civil servants, Filipinos, Chinese, etc. It should be noted that the population has increased about 125 per cent since 1900.

CHAMORRO CULTURE

The degree of sophistication in Agana and Sinajana, the largest towns on the island, is comparable to that of any American city of similar size. Radios, theaters, automobiles, electrical appliances, beauty parlors, Elks and Rotary Clubs, the American Legion, sit-down strikes, food rationing, dog taxes, and Boy Scouts are within the scope of their everyday activities. Business deals require trips between Guam and Honolulu, San Francisco, Manila, Hongkong and Shanghai for Guamanian importers and exporters.

Fifty years of association with Americans have caused the Chamorros to adopt many American customs and habits. The Chamorros are not lazy and indolent. They are not dishonest and irresponsible. When working for themselves they do not follow the same regular routine as do foreigners but when the need for steady work arises they are capable and willing to devote many hours to a task. They assume community responsibilities and are one hundred per cent loyal to the United States. In spite of the two and a half years occupation by the Japanese no evidence of disloyalty has been found. The Guamanians have learned the real value of the American dollar and are well aware of the wage differentials between wages paid themselves and Americans, or between themselves and Off-islanders for work of an identical nature.

[6] Naval Government of Guam, *Monthly Report*, December, 1947.

Most of the Guamanians live in villages and have nearby ranches of a few acres where those members of the family not in school are employed by the Naval Government, work during the day. Sinajana (Fig. 1) with approximately 8,000 residents has surpassed Agana, formerly the largest town in Guam, and is a modern, well-equipped metropolis with water mains, electricity, gravelled streets, schools, churches, shops, drugstores, restaurants, a theater and several bars. Like the other villages, Agana,[7] Dededo, Agat, Piti, Yona, Barrigada, Inarajan, Talafalo, Merizo, Umatac and a number of others, Sinajana is out-of-bounds for non-residents.

The Chamorro language has been influenced considerably by Spanish, Portuguese, English, and to a lesser extent by German and Japanese. Contrary to popular thought the Chamorro language is not "pidginized" Spanish. Perhaps 10 per cent of the vocabulary can be traced to a Spanish origin. A knowledge of Spanish facilitates, but does not guarantee, the ability to speak Chamorro. In spite of fifty years of administration by the United States, English, altho widely used and understood, is not the tongue spoken in the homes. There is a dearth of Chamorro literature available for reading and study.

Christianity has been actively propagated since the arrival of the Jesuit missionaries in 1598.[8] When the Jesuits were expelled by Spain in 1769, the Augustinian Mission assumed control of spiritual matters until Guam became an American possession. In 1901, four Spanish Capuchins replaced the Augustinian Fathers, and in 1945 an American Capuchin bishop and twelve missionaries were sent to Guam.[9] About 95 per cent of the Guamanians are Roman Catholics. Of the Protestant denominations only the American Baptist Mission has gained any adherence worthy of note. Religion plays a very important role in the everyday life of the people.

Guamanian youngsters are receiving educational training which is geared to fit them for life on Guam, and with certain adjustments, to continue schooling in Hawaii and the United States.

[7] Agana, the present capital and pre-war "big town" was severely bombed and almost completely destroyed by American invading forces in July, 1944. Agana is being rebuilt along modern lines and will soon regain its pre-war position as the social, political, business and recreational center for the island.

[8] Garcia, *op. cit.*, p. 39.

[9] Included among the twelve were three nuns, one of whom is a Guamanian with many years training in America.

There was over 85 per cent literacy in Guam according to official reports,[10] altho a large number of the older people do not read or write the English language. Over 7,200 children or about 30 per cent of the total Guamanian population are enrolled in 21 schools (Fig. 3). The annual summer session held in Agana by the University of Hawaii drew 134 teachers in 1947. Well trained school administrators, supervisors, and teachers from the United States augment the

FIG. 3. Students of the George Washington High School pass to their classes. Note the quonsets that serve as class rooms until permanent structures can be built. (Courtesy U. S. Navy)

local staff. American youngsters attend the George Washington High School along with the Guamanian students. A supervised work-study program is provided in the various shops and military establishments for those who elect to take the vocational curriculum. The Board of Education in October, 1947, authorized the establishment of a Junior College beginning with the 1948-1949 school year. A post-graduate course for normal training students has been given in conjunction with George Washington High School for the past two years.

Guam boasts of an excellent public health and sanitation pro-

[10] *Sixteenth Census of the United States*, 1940, p. 10.

gram manned by trained naval and Chamorro personnel. The program includes a hospital, school for medical practitioners, school of nursing, school of dentistry, leper colony, pre-natal clinic, child health clinic, dental clinic and a tuberculosis sanitorium. Veneral Diseases are now under control and a tuberculosis preventative and curative program is now receiving major attention.

Moving pictures, radios, U.S.O. performances, high wages, legalized hard-liquor sales, American military personnel and their dependents, civilian laborers, and tours of duty in the military services, have all played significant roles in disrupting the social organization of the native culture, and yet have failed to instill moral controls so necessary in a western civilization.

Occupations

Agriculture on Guam reflects an adjustment of native abilities and methods to imported crops and appetites. The former desire to be self-sufficient no longer exists. Many of the Guamanians work for the administration and cultivate their "ranches" on the side or allow them to remain fallow. Of the 5,620 males over sixteen years of age, only 455 classify themselves as farmers. At present, roughly 1,750 of the 3,100 arable acres are under cultivation. The remainder is being used by the administration and the armed forces from which the returns are higher than from farming and gardening.

Cultivated land on the average-sized Guam farm or ranch consists of two or three acres of coconuts, some pasture growth, a few bananas, breadfruit, and papaya trees, and several plots of corn, sweet potatoes, possibly some rice, tapioca, melons, pineapples and vegetables. Pigs and chickens are reared on most farms. Only a few of the farmers are tenants. A majority of the farmers live in villages from which they commute daily to their small huts on their farms. A bull and plow, a two-wheeled cart, a couple of machetes and hoes constitute the usual tools. Only on the government farms are tractors and mechanized implements used.

Livestock and poultry were very scarce after the Japanese occupation, but they are on the increase again. Arrangements have been made for the purchase of high grade stock thru Government channels. The Guam Department of Agriculture has an extensive program for introducing new crops and methods and improving livestock breeds and strains.

Guamanian manufacturing and processing is dependent on locally produced agricultural crops for the Guamanian market. Coconut oil, soap, ice, soft drinks, woodwork, furniture, jewelry, cement and tile, leatherware and bakery goods are the only manufactured or processed items worthy of note. A number of men are employed as mechanics, repairmen, electricians, plumbers and carpenters. Heavy industry, construction work, and shipbuilding and repair are conducted by the Administration. The Guamanians are particularly clever and adept in shell, bead, and pandanus work, wood carving and metal working.

FIG. 4. A Guamanian ranch home consists of a straw or palm thatched house on stilts surrounded by coconut palms, banana, papaya and breadfruit trees. Many of the farmers maintain homes in the villages where they spend their week ends.

Altho a considerable portion of upland Guam is forest-covered, the timber is not commercially exploitable. Bamboo, palms, breadfruit, and daog are used locally for fuel and construction. Betel nuts, coconut palm leaves for thatching and medicinal roots, herbs and berries are collected for home use.

No mineral resources of significance are found in Guam except the coral limestone which is used for road building, air strips, and fill. Some low grade alumina-bearing shales are found but not in economically exploitable quantities.

The island is well supplied with highways, communication, and transportation facilities, and public utilities which are furnished free or at very reasonable rates by the Administration.

HISTORY

Guam proved to be a haven of rest when it was discovered in 1521 by the Magellan expedition and because of its harbor and resources it became an important stopping place on the long voyages from Mexico to the Philippines "Altho Guam was visited by most of the early voyagers and became a regular port of call for the Manila galleons as early as 1565, for 150 years the Chamorros remained little disturbed from influence of the outside world."[11]

Legaspi took formal possession of the Marianas, then called the Ladrones,[12] in 1565; but the Spaniards did not establish a permanent settlement until 1668, when a party of Jesuits and soldiers led by Padre Diego Luis Sanvitores landed on Guam. Within a few decades all the islands were brought under Spanish control and to facilitate bringing the Chamorros under the influence of the missionaries the Northern Marianas were depopulated and the islanders were transferred to Guam. Food supplies ran low, epidemics became prevalent and the Chamorros were unruly, disrespectful and dissatisfied. A great many died but the remainder were successfully Christianized. Sanvitores estimated the indigenous population in 1688 for Guam at 50,000 and the Northern Marianas at 40,000 or more. By 1900 the population had shrunk to fewer than 10,000.[13]

Guam fell to an American naval force which bombarded the Spanish capital of Agana and captured the island without casualty or difficulty on June 20, 1898.[14] By executive order of President McKinley on December 23, 1898 Guam was placed under the protection of the United States Navy. Except for a period of Japanese occupation from December 10, 1941 to July 21, 1944 Guam has been under naval administration.

PRESENT DAY GOVERNMENT

The political status of Guam has always been peculiar since its acquisition by the United States. By the Treaty of Paris, December

[11] Thompson, Laura, *Guam and Its People*, Princeton University Press, 1947, p. 5.

[12] In 1688 the name "Ladrones" meaning "The Isles of Thieves" was changed to "Marianas" by Sanvitores, an early missionary-historian, in honor of Queen Marie, wife of Felipe IV of Spain.

[13] *Sixteenth Census of the United States*, 1940, pp. 1-2.

[14] Beers, H. P., *American Naval Occupation and Government of Guam, 1898 to 1902*, Office of Records Administration, Navy Department, March 1944.

10, 1898, Congress was committed to determine the political and legal status of the island, but thus far has failed to act. As a consequence neither the constitution nor the laws of the United States apply to Guam. The island is classified as an unorganized United States possession.[15] In its decisions the Supreme Court has determined that Guamanians do not have American citizenship nor the right of trial by jury until conferred by Congressional legislation. As in the United States, the guaranty against deprivation of life, liberty and property without due process of law has been extended.

Administrative authority is derived from President McKinley's executive order, which delegated such power to the Navy Department.[16] The Navy Department thru a high ranking officer, usually a Captain, and his staff of officers and civilians responsible directly to the Secretary of National Defense, administers the laws and regulations promulgated by the United States Congress, the Governor of Guam and the Guam Congress, a bicameral representative body with advisory but not legislative power.

Considerable agitation has been aroused in Guam for citizenship and statehood. Several bills have been presented to Congress which would grant varying degrees of civil rights, judiciary reforms, political recognition, citizenship and statehood to the Guamanians. None of the bills has been given congressional approval altho President Truman has strongly recommended that full consideration be given a bill providing for an organic act for Guam.

In spite of opposition by certain mainland groups which have encouraged influential Guamanians to demand withdrawal of the Navy from the island, the Guam Congress in joint session on September 6, 1947 passed by an overwhelming majority a resolution for the continuation of Naval Government until the people "have been completely rehabilitated and the Island economy fully recovered."[17]

Conclusion

Guam is recognized as one of our major bases in the Pacific and millions of dollars will continue to be spent to make it a veritable fortress. Because of its strategic location it will remain of prime importance in our far flung Pacific holdings. From an economic standpoint it will remain a financial liability unless it can

[15] *Report to United Nations on Guam and American Samoa,* Assistant Chief of Naval Operations, 1946, p. 3.

[16] Beers, H. P., *op. cit.,* p. 20.

[17] *Navy News,* Guam Edition, September 7, 1947.

be made to support itself. Agriculture can be extended provided the returns can be made to equal or surpass the income from wages paid by the administration and construction firms. Such tropical and sub-tropical plants as rubber, tea, cinchona and cotton will doubtlessly be grown experimentally in an endeavor to obtain additional cash crops. Guam should become the financial, educational, recreational, and political center for the American Trust Territory of the Pacific.

LAKE CARGOES AS GRAPH MATERIAL ON AN ELEMENTARY LEVEL

ADELAIDE BLOUCH
Hayes School, Lakewood, Ohio

The lake freighters are a familiar sight to boys and girls of the lower lake ports and the kind and amount of their cargoes, an interesting subject for investigation during a study of this region. Our fifth grade classes are able to view the shipping at close range in a field trip to Cleveland's harbor, our Flats Trip. If an ore boat is being unloaded, we stop at the Pennsylvania docks, by prearrangement, to watch the Hulett unloaders at work and to ask a guide about the work. Some of the questions are:

"Where did the boat come from?"
"Where will she go from here?"
"How much does she hold?"
"How long will it take to unload?"

During our trip we see other boats which may be carrying ore, coal, limestone, scrap iron, pig iron, oil, gasoline, or possibly grain. We note the names of the boats and the facts which we can observe.

Before and after the trip, the attention of the boys and girls is directed to the marine columns in the daily papers, where there is a twenty-four hour record of boats arriving and clearing the port of Cleveland. These are listed by name and the cargoes are also given. This information provides material for making simple graphs. Using a rubber stamp of a lake freighter, we print the correct number of boats arriving and those clearing on separate sheets of paper. By adopting a code, we can show in different colors the various kinds of cargoes, leaving uncolored the correct numbers for those arriving or clearing light. After these graphs have

been made over a period of a week or two, the class can begin to generalize and to see the reasons for statements such as:

"More than nine-tenths of the freight brought to Cleveland by boat is iron ore."

"More than nine-tenths of the freight shipped away by boat is bituminous coal."

"The amount of freight shipped into Cleveland far exceeds the amount shipped out."

We then look for statistical data on a yearly basis, which will give us facts to use in graphs, taking as a unit of measurement one printed boat to express a round number.

In the meantime, the interest of the class in lake shipping has extended beyond the port of Cleveland. The work of other lake ports has attracted their attention. In looking for data about Cleveland, they also find statistics on Toledo, Buffalo, Duluth, and other ports, which they can use in boat or bar graphs. They learn to arrange the names of the lake cities according to the total volume of shipping and also by volume of certain cargoes. These facts can readily be presented in a graphic form by using a boat or bar to express a round number.

In the "Statistical Abstract of the United States" and other sources of such information, data is given for several successive years of shipping. While line graphs are quite complicated for elementary pupils, it is worth while to introduce this activity by working one out on the blackboard or displaying one which has been made on tagboard, and to give some practice in reading the story which it tells. Usually there are a few pupils who follow up this new activity and ask for help and suggestions in making other line graphs.

Each pupil is encouraged to select one or two particular boats to follow in the marine news. As the time of arrival at certain passages in the lakes is listed, the boats may be followed from day to day and it becomes quite an exciting game to follow "my boat." Sometimes we mount a large map of the Great Lakes on a bulletin board and cut out little boats to move about on pins. Needless to say, parents are drawn into the activity thru requests to be taken to the Flats if it seems likely that certain boats may be arriving.

The question of comparative lengths and capacities of the different boats leads to another line of investigation. These facts and others are given in *Green's Great Lakes Directory* and *The Great*

Lakes Red Book. When a number of pupils have looked up the information about their boats, it can be charted or used in making graphs.

In the marine news we find many interesting items, statistical and otherwise about the lakes, and long after the geography study has passed to other regions, clippings are brought in to be read to the class.

Such activities are time-consuming and of necessity must be limited to a short period daily because, as every teacher knows, we must not linger too long but must push on. However, the interest aroused is so sustained and so productive of material which may be used in developing certain abilities, that the subject of Great Lakes shipping is well worth all of the time we can possibly give to it.

STEPHEN S. VISHER RECEIVES THE DISTINGUISHED SERVICE AWARD IN GEOGRAPHIC EDUCATION

In recognition of contributions to the field of geography and for outstanding services in the field of educational geography, the Distinguished Service Award is this evening conferred upon Dr. Stephen Sargent Visher of Indiana University.

Dr. Visher has been active in many phases of geography for many years. His contributions and writings include grade school and college levels as well as scientific and philosophical works. The many facets of his activities include diverse experiences; such as participation in expeditions to the South Seas and to Alaska, state and federal geological surveys, the United States Bureau of Soils, the Soil Conservation Service, and the Department of State. Last but not least, Dr. Visher has taught in several universities and has a record of thirty years service at Indiana. In 1943, Dr. Visher was awarded the Distinguished Alumnus Citation by the University of Chicago, and in 1945 an Honorary Life Membership in the National Geographic Society.

As a scholar, Dr. Visher is recognized for his initiative and resourcefulness, for his painstaking attention to details, and to his originality in undertaking unusual studies. The wide variety of his wriitngs indicate the breadth and depth of his interests. The volume on *The Climate of Indiana,* his recent book on *Starred Scientists,* and the forthcoming *Climatic Atlas of the United States* are remarkable scientific studies—the results of long and patient research.

As a person, Dr. Visher has the human touch—the understanding and sympathy that have encouraged students and colleagues to enlarge their interests in the field of geography. In ways unknown to many, Dr. Visher has contributed to the recognition of geographers and their writings. Such a gesture is the mark of a learned and modest scholar.

As a writer for the JOURNAL OF GEOGRAPHY Dr. Visher has contributed more articles in the last thirty-five years and has written more reviews than has any other person.

As an active member of the National Council, Dr. Visher's unfailing willingness to help further the cause of geography is remembered by all with whom he has been associated. He has taken part in programs and served on committees. Dr. Visher is counted among the small group who have attended most of the meetings of this organization.

It is indeed most appropriate that the Distinguished Service Award be conferred by Pres. Barton upon Dr. Stephen Sargent Visher.

Committee
MARY JO READ
HARRY O. LATHROP
ALISON AITCHISON
GEORGE B. CRESSEY
THOMAS BARTON
CLYDE KOHN
M. MELVINA SVEC, *Chairman* 1948

THE NATIONAL COUNCIL AT WORK

Geographic Approaches to Social Education

Two general questions are asked frequently, namely, first, "Where may I secure the yearbook on geography?", and second "Does the content of the yearbook carry the official approval of the National Council of Geography Teachers?"

Dr. Clyde Kohn answers the first question in the following way: "The Nineteenth Yearbook of the National Council for the Social Studies, *Geographic Approaches to Social Education,* may be obtained by writing directly to Merrill F. Hartshorn, Secretary of the National Council for the Social Studies, 1201 Sixteenth Street, N.W., Washington, D.C. The Yearbook is distributed free to members of the National Council for the Social Studies, and will be mailed to all members of this organization after the Christmas holidays." Non-members of the N.C.S.S. may obtain copies directly from Mr. Hartshorn at $2.50 in paper covers; $3.00 in cloth covers.

In answering the second question, namely, "Does the content of the yearbook, Geographic Approaches to Social Education, carry the official approval of the National Council of Geography Teachers?", permit me to quote from the official minutes of the Executive Board held in Charlottesville, Virginia, on December 28, 1947, as follows, "A motion was made and carried that (1) Somewhere in the 1948 Yearbook of the National Council for the Social Studies there should appear the statement that the remarks contained therein are the opinions of the individual authors, and (2) it should be made perfectly clear that this yearbook is not dealing with the 'teaching of geography' but is a Yearbook on" *Geographic Approaches to Social Education.*

Preparation of the Thirty-Fourth Meeting Program

Because it was omitted on the program, I wish to add here that Dr. Earl B. Shaw, first vice-president, was responsible for Saturday morning's program. Dr. Shaw and Miss Eiselen prepared the sectional program on Color Transparencies. Dr. Warren Strain, first vice-president of Gamma Theta Upsilon, prepared its sectional meeting. I also wish to thank these persons, the Executive Board members, and others who offered suggestions for the program.

Committee on Reading

At the Charlottesville meeting, the Executive Board approved a reading project which had been recommended in the Planning Committee report. The report reads: "It is recommended that a committee of three be appointed for three years to prepare or to direct the preparation of material for a series of leaflets on reading materials and their use in teaching geography. The first leaflets in this series should be selected from the following topics or from others approved by the Executive Board: bibliography on the use of reading materials in geography; a list (with brief objective annotations) of high school textbooks; a bibliography of recreatory reading on the United States at the Intermediate grade level." Dr. Edna Eisen, Chairman is at Kent University, Kent, Ohio.

Seal

The Seal Committee completed its work in 1947. Professors Guy-Harold Smith, Loyal Durand, Jr., and George J. Miller have the thanks of all council members. The Executive Board established 1915 as the official date of the founding of the National Council of Geography Teachers. This date will appear on the seal. Consequently the meeting to be held in Chicago this year will be the Thirty-Fourth Annual Meeting. The seal has been made and is in the possession of our secretary, Dr. Kohn.

Thank you

In behalf of the National Council and myself, I wish to thank all committee members and chairmen, participants in the Thirty-Fourth Annual Meeting, officers, and

others for the splendid cooperation and unselfish service they rendered during the past year. The National Council is a working organization.

We have a good group of officers for next year. I feel sure that with every member's help, the organization will complete several projects and give us an excellent program at our Thirty-fifth Meeting.

THOMAS F. BARTON, *President*

EDITORIAL NOTES AND NEWS

According to reports from Windhoek, Bechuanaland, the Kalahari Desert has furnished ample food for thousands of cattle and sheep during 1948. Following unusually heavy rains, many kinds of grass and plants sprouted and made good growth. Here is an excellent illustration which refutes the misconceptions that deserts are always dry and all their soils infertile. The unusual rainfall has revived an old irrigation plan to pump water from the Orange River into adjacent desert areas enabling farmers to raise lucerne, wheat, millet and barley.

Professor Emeritus WILLIAM H. HOBBS of the University of Michigan geology department is advocating that a canal be constructed between Puerto Mexico on the Atlantic coast to the Tehuantepec lagoon directly south on the Pacific. The distance across the continent at this point is only 126 miles. A quarter of the way on each end of the proposed canal is across level coastal plains. It would be necessary to burrow about 63 miles thru Mexico's central range of mountains.

Dr. Hobbs stresses that the proposed Mexican canal would have three major advantages over the Panama Canal. 1) It would shorten the shipping lanes between east and west coast ports of the United States by some 3,000 miles. 2) The canal could more easily be protected. There would be no vulnerable locks to be smashed by enemy bombs. Air protection would be possible with planes based on airfields in the United States and the central half of the canal would be protected from aerial bombing by impenetrable layers of solid rock. 3) Two way traffic would be available with double lanes on the open part and "sidings" in the tunnels.

It is proposed that "this ship subway be 185 feet wide—75 feet more than the Panama Canal—and 185 feet high at the center peak of its sloping ceiling. Large constructional and ventilation shafts would chop the tunnel into eight small tunnels," according to Hobbs. "Anything except some of the ships with extensive radar-radio masts would get thru this tunnel. The top parts of the masts could be reassembled on the other side with the money saved in fuel." A committee of the 81st Congress will study the Mexican Tunnel Canal proposal soon.

Some persons criticize elementary textbooks for including content on ice and snow; they say "that children in our southern states have not had experience with snow." While it is true that some children in southern states have not seen snow, "not one of the forty-eight states completely escapes" snowfall. In the southeast almost every year, cold northern winds bring light snow and a touch of frost to northern and central Florida's orchards and truck patches. In the southwest on the western slopes of the Sierra Nevada mountains in California has occurred the heaviest single and seasonal snowfall recorded in the United States.

GEOGRAPHICAL PUBLICATIONS

Gertrude Whipple and Preston E. James. **Living on Our Earth.** 282 pages. 74 maps. 237 pictures and sketches, 45 of which consist of kodachromes. Index. Macmillan Company, New York 11, New York. 1948. $2.40.

This book is the third in the series known as the Whipple-James Basal Geographies. The first book in the series was called *Our Earth;* the second book was called *Using Our Earth.* The present volume, *Living On Our Earth,* is designed, in the words of the authors, "to provide the beginnings of regional geography." The first two volumes of the series were designed "to help children develop geography readiness," and have been written for use in the third and fourth grades. The present volume is for use in the fifth grade.

The book, *Living On Our Earth* is printed on paper of excellent quality; a clear type is used and of a size that is easy to read. The paragraphs are emphasized by bold-faced type. The binding is durable. The size of the book is convenient, neither too large nor too small. A simple design on the outside cover announces the name of the text. The general make-up of the book is attractive.

While the authors state that the text does not follow the usual journey type of geography, frequently used for introductory texts in this grade, but by selecting simple human cultures, they seek to initiate the students of the fifth grade into the study of regional geography. The first seven chapters deal with a variety of human cultures, ranging from the simple life of the Canoe People to the more complex life of the Rice Farmers of China. The areas selected emphasize a wide range of geographic conditions, cold lands, hot lands, dry lands, arid lands and rough lands. The last part of the book gives the child an opportunity to study in greater detail the country of China and Japan. Out of the fifteen chapters in the text, five are given to the study of China; in the 277 pages of the text, 30 per cent of the text is devoted to China.

The maps, some in color and some in black and white, are carefully graded and range from simple globes to perspective maps, showing curved surfaces and to detailed maps for showing climatic, physical, population, and political features. Each map is designed to show one single map concept and in the study-aids the authors have made excellent use of the maps for developing these concepts.

Considerable care has been givn to the development of a geographical vocabulary. Each new word, when first introduced, is italicized and defined. The child is given numerous opportunities to use the words in well selected exercises.

Pictures are well chosen to fit the context and are used thruout the text to teach definite geographic concepts. An example of these skills will be found on page 55. The kodachromes have an eye appeal to children and because of the excellent paper used the pictures are unusually clear and effective.

The book aims to (1) develop interest in geography, using well graded material; (2) to develop the ability to think geographically; and (3) to provide an effective approach to the mastery of maps. This book will be welcomed by teachers teaching geography in our elementary schools.

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